APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,096	12/31/2003	Jason Lin	SNDK.345US0	1337

66785 7590 03/27/2007	EXAMINER
PARSONS HSUE & DE RUNTZ, LLP - SANDISK CORPORATION	FARROKH, HASHEM
595 MARKET STREET	
SUITE 1900	ART UNIT / PAPER NUMBER
SAN FRANCISCO, CA 94105	2187

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/751,096	LIN ET AL.
	Examiner	Art Unit	
	Hashem Farrokh	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *11 December 2006*.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) *5-7,13-26 and 30-32* is/are allowed.

6) ☒ Claim(s) *1-4,8-12 and 27-29* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *08 March 2004* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/23/07*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

This Office Action is in response to the Applicant's Remarks filed on December 11,

2006. The instant application having application No. 10/751,096 has a total of 32 claims

pending in the application; no claims have currently been amended, canceled, or added.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 8-12, and 27-29 are rejected under 35 U.S.C. 102(e) as being

anticipated by U.S. Patent Publication 2003/0163663 A1 to Aasheim et al. (hereinafter

Aasheim).

1.   In regard to claim 1 Aasheim teaches:

"A non-volatile memory (e.g., paragraph 73 in page 6; Fig. 8) comprising a plurality of

data storage areas (e.g. Sector Nos. 1-N in Fig. 8), each of the data storage areas

containing:" (e.g., paragraph 73 in page 6; Fig. 8).

"a user data portion;" (e.g., see Data Region 804 in Fig. 8).

"and an overhead data portion," (e.g., see Metadata Area 806 in Fig. 8).

"wherein the overhead data portion of each data storage area contains a first flag for

indicating that another one of the data storage areas is correctly written." **(e.g.,**

paragraph 73 in page 6; paragraph 132 in pages 10 to 11; Figs. 8 and 20). *Aasheim*

teaches the Metadata includes pointers that indicate the next region contains valid data.

The pointer represents the flag recited in the claim. Furthermore, Aasheim teaches the

transaction log metadata 2008 permits any physical sector(s) to be readily identified

from other physical sector containing data, as a physical sector that contains transaction

information.

2.   *In regard to claim 2 Aasheim teaches:*

"wherein the overhead data portion of each of said data storage areas further contains a

second flag for indicating that the data storage area itself is correctly written." **(e.g.,**

paragraph 119 in page 9). *Aasheim teaches that a data valid bit is written if the result*

of write operation is successful (e.g., correctly written) or is not corrupt. The valid bit

represents the second flag recited in the claim.

3.   *In regard to claim 3 Aasheim teaches:*

"wherein each of said data storage areas corresponds to a sector of data." **(e.g., see**

paragraph 73 in page 6; Fig. 8).

4.   *In regard to claim 4 Aasheim teaches:*

"wherein the data storage areas are organized into a plurality of units of erase **(e.g.,**

Block 0 to Block N in Fig. 4), and wherein the overhead data portion of a

predetermined data storage unit in each of the units of erase further contains a third flag

for indicating that the unit of erase to which the predetermined data storage unit belongs

has had an erase operation completed." **(e.g., paragraph 106 in page 8; Clear Pointer**

1502 in Fig. 15). *For example clear or erase pointer represents the flag recited in the*

claim.

5.   *In regard to claim 8 Aasheim teaches:*

"A non-volatile memory **(e.g., paragraph 73 in page 6; Fig. 8)** comprising a plurality of

data storage areas each of the data storage areas containing:" **(e.g. Sector Nos. 1-N in**

Fig. 8).

"a user data portion;" **(e.g., see Data Region 804 in Fig. 8).**

"an overhead data portion **(e.g., see Metadata Area 806 in Fig. 8)**, wherein the

overhead data portion of each data storage area contains a first flag for indicating that

another one of the data storage areas is correctly written **(e.g., paragraph 73 in page**

6; paragraph 132 in pages 10 to 11; Figs. 8 and 20), wherein said first flags are each

composed of multiple bits." **(e.g., paragraph 92 in page 7).** *Since the write pointer*

points to next available free sector therefore inherently is multiple bits.

6.   *In regard to claim 9 Aasheim teaches:*

"wherein said data storage areas are written according to a predetermined sequence

and wherein said another one of the data storage areas is the preceding data storage

area in the sequence." **(e.g., see Fig. 14 and relevant paragraphs in page 8).**

7.   *In regard to claim 10 Aasheim teaches:*

"wherein said first flags and the content of the user data portions are protected by error

correction code (ECC)." **(e.g., see paragraph 59 in page 5).**

8.   In regard to claim 11 Aasheim teaches:

"A non-volatile memory **(e.g., paragraph 73 in page 6; Fig. 8)** comprising a plurality of

units of erase each having a plurality of data storage areas, each of the data storage

areas containing:"

"a user data portion;" **(e.g., see Data Region 804 in Fig. 8).**

"an overhead data portion **(e.g., see Metadata Area 806 in Fig. 8)**, wherein the

overhead data portion of a predetermined data storage unit in each of the units of erase

further contains a flag for indicating that the unit of erase to which the predetermined

data storage unit belongs has had an erase operation completed." **(e.g., paragraphs**

106-107 in page 8; Clear Pointer 1502 in Fig. 15). *For example clear or erase pointer*

represents the flag recited in the claim.

9.   In regard to claims 12 and 29 Aasheim teaches:

"wherein said flag is comprised of multiple bits." **(e.g., paragraph 92 in page 7).** *Since*

the write pointer points to next available free sector therefore inherently is multiple bits.

10.   In regard to claim 27 Aasheim teaches:

"A method **(e.g., Fig. 9)** of operating a non-volatile memory **(e.g., paragraph 73 in**

page 6; Fig. 8), comprising: erasing the data content of a block of the non-volatile

memory **(e.g., paragraph 105 in page 8)**, wherein the block **(e.g., Block 0 in Fig. 4)**

comprises a plurality of sectors **(e.g., Sectors 402 in Fig. 4)** each having a data portion

(e.g., Data Area 403 in Fig. 4) and an overhead portion;" **(e.g., Spare Area 404 in Fig. 4)**

"verifying that the block is successfully erased;" **(e.g., paragraph 71 in page 5).** *For example Aasheim teaches that the blocks are erased or cleared to ensure that free space is available.*

"and writing an indication that the block is successfully erased into the overhead portion of a designated one of the sectors." **(e.g., paragraphs 106-107 in page 8; Figs. 7-8).** *For example the erase or clear pointers are used to point (e.g., to indicate) and keep track of blocks that are cleared.*

11.   In regard to claim 28 Aasheim teaches:

"wherein said indication comprises a flag." **(e.g., paragraph 106 in page 8).** *For example the clear pointer represents the flag.*

ALLOWABLE SUBJECT MATTER

Claims 5-7, 13-26, and 30-32 are allowed.

1.   The primary reason for allowance of claims 5-7 in instant application is the combination with the inclusion of the following limitations: <u>**wherein the data storage areas are organized into a plurality of units of erase, and wherein each of said blocks further contains an additional data storage area for overhead data portion of which having said second flag and not having said first flag.**</u>

3.   The primary reason for allowance of claims 13-15 in instant application is the combination with the inclusion of the following limitations: <u>**wherein during a sequential**</u>

write process of data into two or more of said data storage areas, for each data

storage area subsequent to the first, an indication of the write of the preceding

data storage area is written into the current data storage area as part of its write

process.

4.   *The primary reason for allowance of claims 16-20 in instant application is the*

combination with the inclusion of the following limitations: **concurrently with said**

programming second content, writing to the second data storage area an

indication that the first data storage area is correctly programmed

5.   *The primary reason for allowance of claims 21-26 in instant application is the*

combination with the inclusion of the following limitations: **finding a first sector not**

indicated to be correctly programmed based upon content of the subsequent

sector; and based on the content of the first sector itself, determining if the first

sector is correctly programmed.

6.   *The primary reason for allowance of claims 30-32 in instant application is the*

combination with the inclusion of the following limitations: **subsequently recording in**

the overhead portion of a second sector an indication that said altering the data

content of at least a first sector is successfully completed

: *IMPORTANT NOTE* :

I f the applicant should choose to rewrite the independent claims to include the

limitations recited in either one of the claims, the applicant is encouraged to ***amend the***

title of the invention *such that it is descriptive of the invention as claimed as required*

be sec. 606.01 of the MPEP. Furthermore, the summary of invention and the abstract

should be amended to bring them into harmony with the allowed claims as required by

paragraph 2 of sec. 1302.01 of the MPEP.

As allowable subject matter has been indicated, applicant's response must either

comply with all formal requirements or specifically traverse each requirement not

compiled with. See 37 C.F.R. § 1.111(b) and § 707.07(a) of the M.P.E.P.

Response to Applicant's Remarks

The Applicant's Remarks has been carefully considered but are not persuasive.

In regard to rejection of independent claim 1, Applicant argues that Aasheim indication

or link list shows only the location that the data next to be written but not the location or

sector that has already been written (page 8 of Applicant's Remarks). In page 9 of his

Remarks Applicant argues:

"Consequently, these values in the "Metadata Area" cannot be based on whether these other sectors have been correctly written. Rather, these values only indicate the sector where the next portion of the data group is to be written as there cannot be, as of yet when this value is written, any knowledge of whether this next sector of data will have been correctly written or not: that is, what is being entered into the "Metadata Area" is more of a hope than an indication that what has happened. In the normal course of memory operation, this hope will eventually become the fact; but it is precisely those cases when this intention fails that is one of the ways in which this aspect of the present invention is of use.
Consequently, for at least these reasons, it respectfully submitted that a rejection of claim 1 and claims 2-4 and 8-10 under 35 U.S.C. § 102(e) as being anticipated by Aasheim is in error and should be withdrawn."

The Examiner agrees that Aasheim teaches the location that next to be written.

However, this indicates the previous location has already been written. For example in

paragraph 132 of his invention, Aasheim teaches:

"The transaction information 2002 further includes metadata 2008 indicating that the arbitrary physical sector address contains transaction information 2002. The metadata 2008 in the exemplary implementation is stored in the spare area of the flash medium, but could be stored in other regions of the physical sector. In particular, transaction log metadata could be any of the one or more bits 0, 1, 2., . . . , N in the spare area of the physical sector used to uniquely identify the physical sector as containing transaction information 2002. Thus, the transaction log metadata 2008 permits any physical sector(s) to be readily identified from other physical sector containing data, as a physical sector that contains transaction information." *(Emphasis added).*

In regard to independent claim 11 Applicant argues that clear or erase flag taught by

Aasheim is not in flash memory.

"For the "flag" of the claim, the Office Action refers to Aasheim's paragraph [0106] and element "Clear Pointer" 1502 as shown there in Figure 15. However, Aasheim's paragraph's [0106] is quite clear that the "clear pointer"1502 is maintained by the "compactor module" 708, which as can be seen in Figure 7 is part of the "Media Abstraction Layer" 606, which is in turn part of the logic layer 602 that is part of the file system 600, as can be seen from Figure 6. As is clear from Figure 6, this is not on the Flash Memory Medium 601. Specifically, it is not in what the Office Action identifies as the "overhead data portion", namely "Metadata Area" 806; rather, this "clear pointer" is part of Aasheim data management structure. Therefore, Aasheim neither discloses nor suggests that "the overhead data portion of a predetermined data storage unit in each of the units of erase further contains a flag for indicating that the unit of erase to which the predetermined data storage unit belongs has had an erase operation completed." Consequently, for at least these reasons, it respectfully submitted that a rejection of claim 11 and its dependent claim under 35 U.S.C. § 102(e) as being anticipated by Aasheim is in error and should be withdrawn." (Emphasis added).

However, in paragraph 107 of his disclosure Aasheim teaches:

"In the event of power failure, the media abstraction layer 606 contains simple coded logic that scans the flash memory medium 601 and determines what locations are marked free and dirty. The logic is then able to deduce that data 1504 resides between the locations marked free and dirty. A head (write pointer) and tail (clear pointer 1502) of the data (also referred to as a data stream 1504) is easily determined by locating the

highest of the physical sector addresses containing data for the head and by locating the lowest of the physical sector addresses containing data for the tail."

As highlighted the media abstraction logic scan the flash memory to obtain the information to determine the free and dirty location. The information or the flags, contrary to the Applicant's argument, stored in the flash memory. In regard to the rejection of the independent claim 27 the Applicant makes a similar argument. However, as stated above, in response to Applicant argument regarding rejection of claim 11, Aasheim teaches that meta data information stored in the flash memory.

In summary the Examiner believes that Aasheim teaches all limitations recited in the rejected claims. Accordingly, the Examiner maintains his position.

Conclusion

THIS ACTION IS MADE FINAL. *Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).*

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
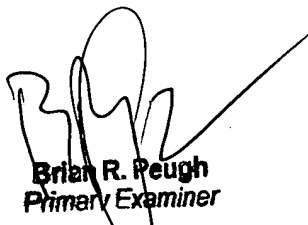
Any inquiry concerning this communication should be directed to Hashem
Farrokh whose telephone number is (571) 272-4193. The examiner can normally be
reached Monday-Friday from **8:00 AM to 5:00 PM.**

If attempt to reach the above noted Examiner by telephone are unsuccessful, the
examiner's supervisor, Mr. Donald A Sparks, can be reached on (571) 272-4201.
Information regarding the status of an application may be obtained from the Patent
Application Information Retrieval (PAIR) system. Status information for published
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866-217-9197 (toll-free).

HF

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2007-03-16

Brian R. Peugh
Primary Examiner